PIONEER

Service Manual

CIRCUIT DESCRIPTIONS
REPAIR & ADJUSTMENTS

The photo shows the model PL-X20Z.

ORDER NO.
ARP-743-0

STEREO TURNTABLE

PL-X20Z
PL-X21Z

PL-X20Z is the same as the PL-X21Z except for the color only. (PL-X20Z comes in silver; PL-X21Z in black)

- **This service manual is applicable to the PL-X20Z/ZUEBM and PL-X21Z/ZUEBM.**
- **Ce manuel d'instruction se rerère au mode de réglage en français.**
- **Cste manual de servicio trata del método de ajuste escrito en español.**

Type	Voltage	Remarks
ZUEBM	(11.3V DC power supply)	USA, European continent, United Kingdom and West Germany model.

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1. SPECIFICATIONS

Drive System	Belt drive
Speeds	33-1/3 and 45 rpm
Wow and Flutter	Less than 0.05% (WRMS) ±0.07% WTD Peak (DIN)
Signal-to-Noise Ratio	More than 68 dB (DIN-B) (with Pioneer cartridge model PC-290T)
Usable cartridge	T4P cartridge

PC-290T Specifications

Type	IM type
Stylus	0.5 mil diamond (PN-290T)
Output Voltage	2.5 mV (1 kHz, 5cm/s LAT. Peak)
Frequency Response	10 to 30,000 Hz
Recommended Load	50 kohms

Miscellaneous

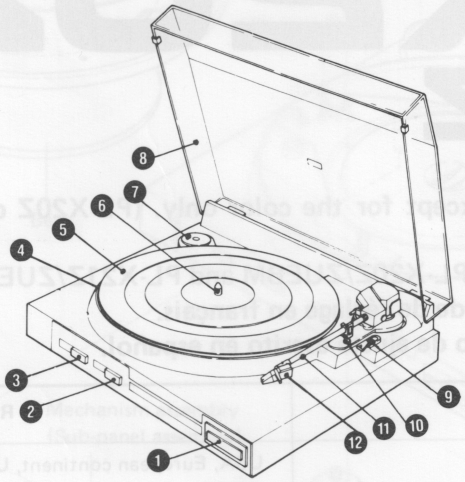
Power Requirements	DC 12V
Dimensions	360(W) x 103(H) x 389(D) mm 14-3/16(W) x 4-1/16(H) x 15-5/16(D) in
Weight	3.2 kg (7 lb 1 oz)

Accessories

EP Adaptor	1
Turntable leg (L and R)	2
Mounting screw	4

NOTE:
Specifications and design subject to possible modification without notice due to improvements.

2. PANEL FACILITIES



❶ START/STOP switch
Press this switch when starting auto play or when stopping play.

❷ DISC SIZE switch
Set this switch in accordance with the size of the record.
30 (▬): For 30 cm LP records. 17 (■): for 17cm EP records.

❸ SPEED switch
Set this switch in accordance with the speed of the record.
33 (▬): For 33-1/3 rpm records. 45 (■): For 45 rpm records.

❹ Platter

❺ Rubber mat

❻ Platter shaft

❼ EP adaptor

❽ Dust cover

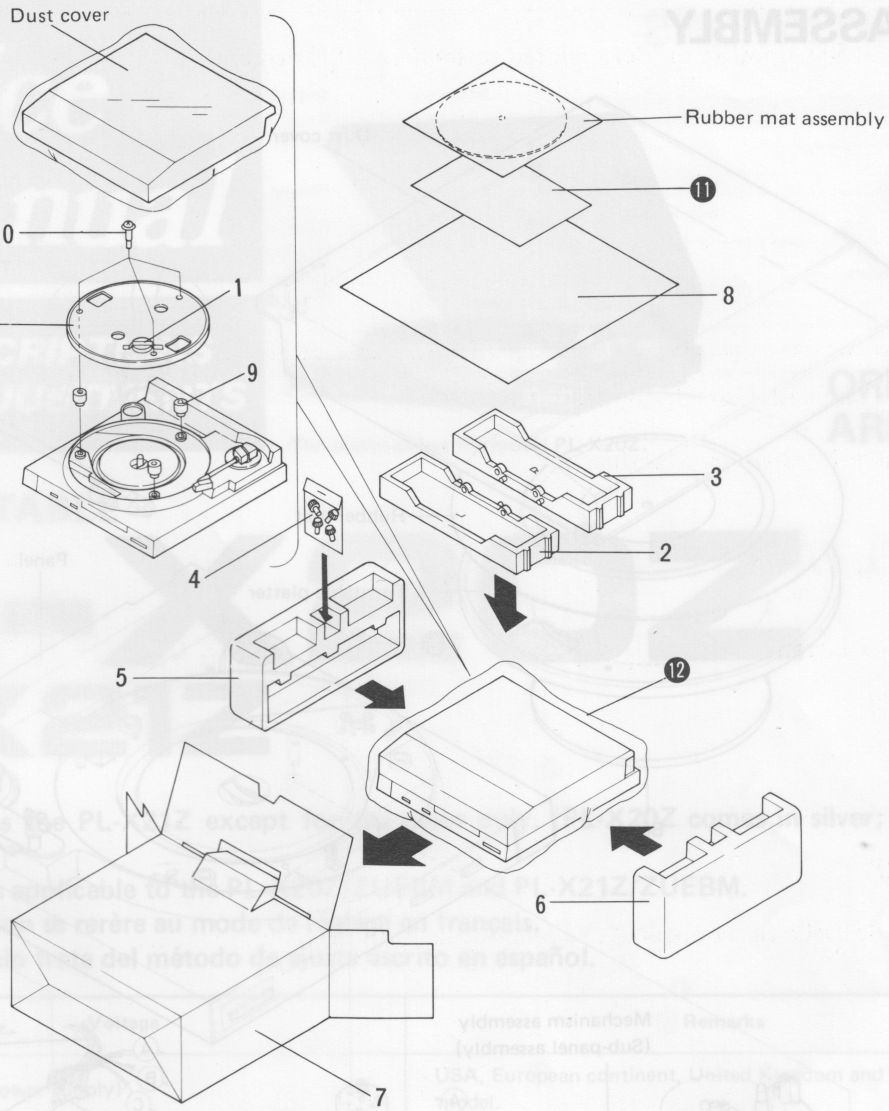
❾ Arm elevation lever

❿ Arm rest and clamper

⓫ Tonearm

⓬ Cartridge

3. PACKING



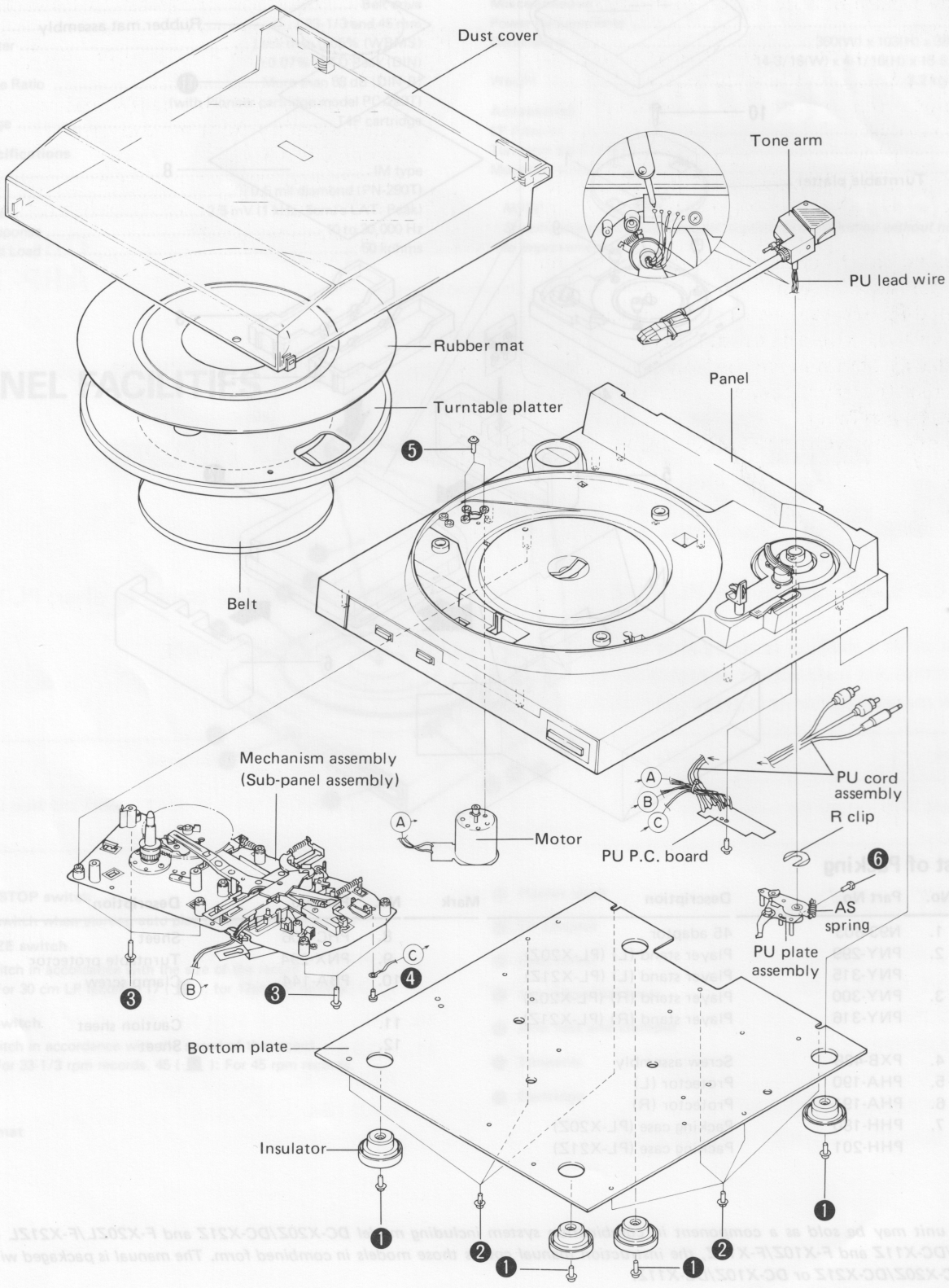
Parts List of Packing

Mark	No.	Part No.	Description
	1.	N93-603	45 adaptor
	2.	PNY-299	Player stand (L) (PL-X20Z)
		PNY-315	Player stand (L) (PL-X21Z)
	3.	PNY-300	Player stand (R) (PL-X20Z)
		PNY-316	Player stand (R) (PL-X21Z)
	4.	PXB-438	Screw assembly
	5.	PHA-190	Protector (L)
	6.	PHA-191	Protector (R)
	7.	PHH-180	Packing case (PL-X20Z)
		PHH-201	Packing case (PL-X21Z)
	8.	PHC-106	Sheet
	9.	PNX-294	Turntable protector
	10.	PBA-144	Clamp screw
	11.		Caution sheet
	12.		Sheet

NOTE:
Since the unit may be sold as a component in combination system including model DC-X20Z/DC-X21Z and F-X20ZL/F-X21ZL or DC-X10Z/DC-X11Z and F-X10Z/F-X11Z, the instruction manual covers those models in combined form. The manual is packaged with models DC-X20Z/DC-X21Z or DC-X10Z/DC-X11Z.

ARE-126 . . . . . DC-X20Z/DC-X21Z (English, French, German, Italian)
ARB-644 . . . . . DC-X20Z/DC-X21Z (English)
ARE-127 . . . . . DC-X10Z/DC-X11Z (English, French, German, Italian)
ARB-645 . . . . . DC-X10Z/DC-X11Z (English)

4. DISASSEMBLY



- **Mechanism Assembly (Sub-panel Assembly) and Motor**

1. Rotate the turntable platter to disengage the mechanism.
2. Fix the tonearm to the arm rest. (Be sure to cover the stylus a the stylus cover.)
3. Remove the rubber mat and then the turntable platter.
4. Close the dust cover, turn the turntable upside down, and place it on a soft surface, e.g., a work bench covered with soft cloth (for product protection).
5. Remove the four screws labeled ❶, and remove the insulator. Then remove the seven screws labeled ❷, and remove the bottom plate.
6. Remove the five screws labeled ❸ and one screw labeled ❹, and remove the lead connected to the microswitch. This operation will release the mechanism assembly.
7. Remove the two screws labeled ❺ to remove the motor.

- **Tonearm**

1. Remove the mechanism assembly from the panel.
2. Unsolder and disconnect the PU leads (arm leads) from the PU printed circuit board.
3. Remove the AS spring from the PU plate assembly.
4. Remove the screw labeled ❻, and remove the PU plate assembly from the tonearm.
5. Remove the R clip.
6. Place the turntable on one of its sides, remove the arm clamp, and gently pull out the tonearm from the panel.

5. PARTS LOCATION

NOTES:

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Front View

★★Dust cover
PNV-058

Rubber mat assembly
PEA-076

Turntable platter
PNR-192

Button (SPEED)
PAC-217 (PL-X20Z)
PAC-220 (PL-X21Z)

Tone arm assembly
PPD-676

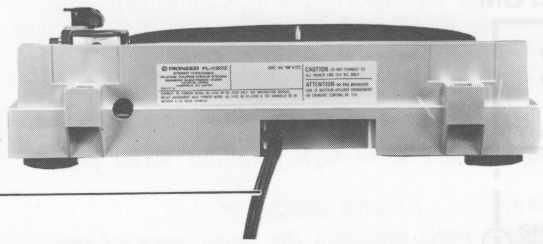
Cartridge assembly (without stylus)
PXV-961

Panel (F) assembly
PXB-425 (PL-X20Z)
PXB-433 (PL-X21Z)

S/S button
PAC-216 (PL-X20Z)
PAC-219 (PL-X21Z)

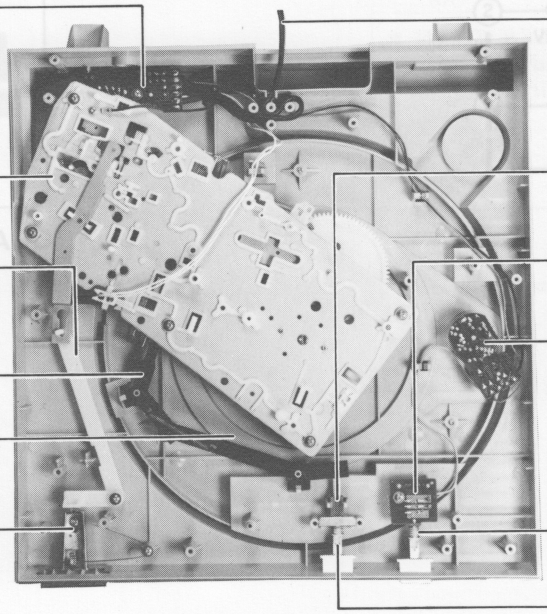
Button (SIZE)
PAC-217 (PL-X20Z)
PAC-220 (PL-X21Z)

Rear View



PU cord assembly
PXB-429

Inside View with Bottom Plate Removed



PU P.C. board

⚠ Sub-panel assembly

S/S lever
PNY-286

Size lever (B)
PNY-289

Size lever (A)
PNY-288

S/S button
PAC-216 (PL-X20Z)
PAC-219 (PL-X21Z)

PU cord assembly
PXB-429

★★Push switch
PSG-047

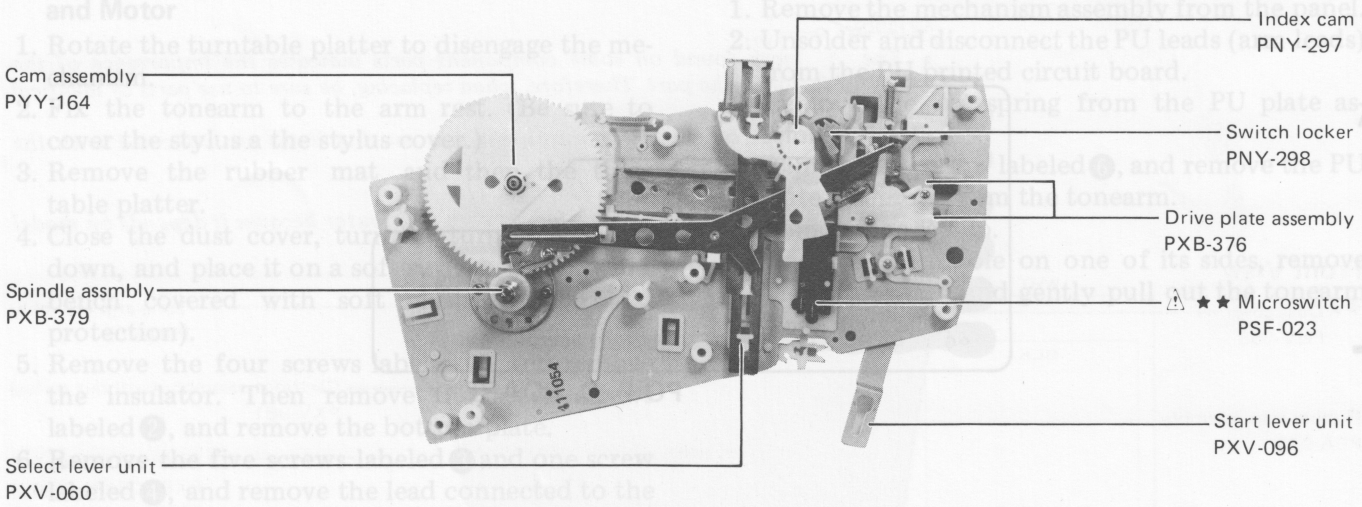
Switch P.C. board

★★Motor assembly (with pulle)
PYY-163

Button (SPEED)
PAC-217 (PL-X20Z)
PAC-220 (PL-X21Z)

Button (SIZE)
PAC-217 (PL-X20Z)
PAC-220 (PL-X21Z)

Mechanism View (Sub-panel Assembly)



6. ELECTRICAL PARTS LIST

NOTES:

- *When ordering resistors, first convert resistance values into code form as shown in the following examples.*
  Ex. 1 When there are 2 effective digits (any digit apart from 0), such as 560 ohm and 47k ohm (tolerance is shown by J=5%, and K=10%).

560Ω	*56 × 10¹*	*561*	*RD¼PS* 5 6 1	*J*
47kΩ	*47 × 10³*	*473*	*RD¼PS* 4 7 3	*J*
0.5Ω	*0R5*		*RN2H* 0 R 5	*K*
1Ω	*010*		*RS1P* 0 1 0	*K*

  Ex. 2 When there are 3 effective digits (such as in high precision metal film resistors).

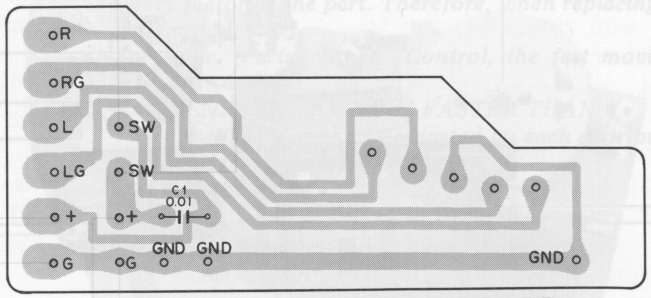
5.62kΩ	*562 × 10¹*	*5621*	*RN¼SR* 5 6 2 1	*F*

- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★ .*
  ★★ GENERALLY MOVES FASTER THAN ★
  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

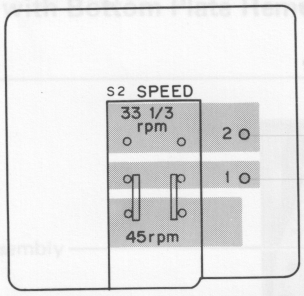
Miscellaneous Parts

Mark	Symbol & Description	Part No.
★	Motor assembly	PYY-163
	PU cord assembly	PXB-429
★★ S2	Push switch (33 – 45rpm)	PSG-056
⚠ ★★ S1	Microswitch (POWER)	PSF-023
★★	Push switch (Record size select)	PSG-047

7. P.C. BOARDS CONNECTION DIAGRAM

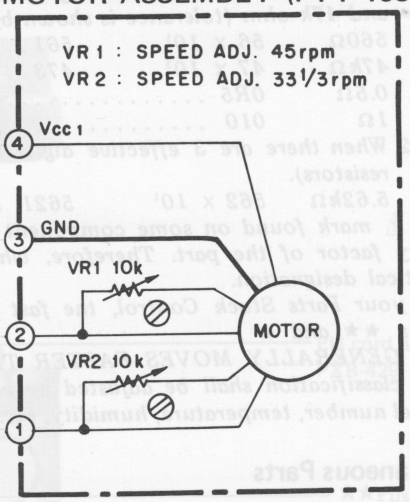


PU P. C. BOARD

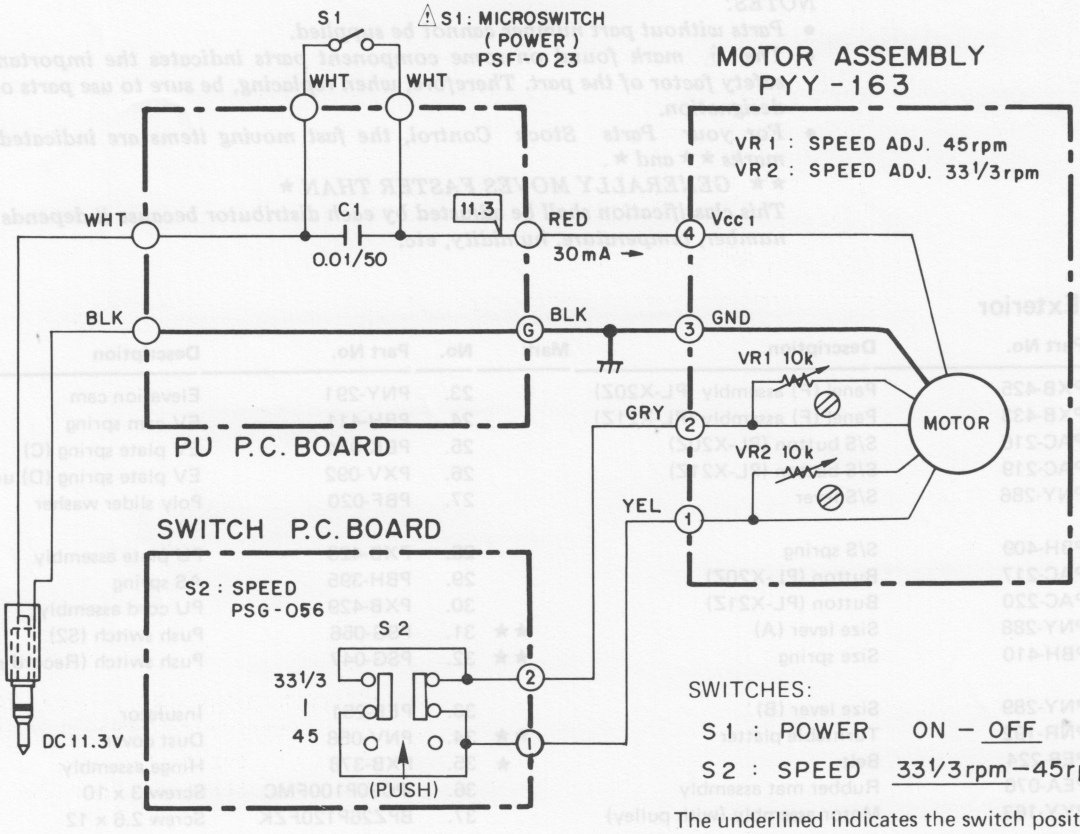


SWITCH P. C. BOARD

MOTOR ASSEMBLY (PYY-163)



8. SCHEMATIC DIAGRAM



SWITCHES:

S1 : POWER ON – OFF

S2 : SPEED 33⅓rpm–45rpm

The underlined indicates the switch position.

1. RESISTORS:
   Indicated in Ω, ¼W, ±5% tolerance unless otherwise noted k : kΩ,
   M : MΩ, (F) : ±1%, (G) : ±2%, (K) : ±10%, (M) : ±20% tolerance

2 CAPACITORS:
   Indicated in capacity (μF)/voltage (V) unless otherwise noted p : pF
   Indication without voltage is 50V except electrolytic capacitor.

3. VOLTAGE
   : DC voltage (V) at no input signal

4. OTHERS:
   ➡ : Signal route.
   ⊘ : Adjusting point.
   The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.
   ※ marked capacitors and resistors have parts numbers.

This is the basic schematic diagram, but the actual circuit may vary due to improvements in design.

9. EXPLODED VIEWS

9.1 EXTERIOR

NOTES:

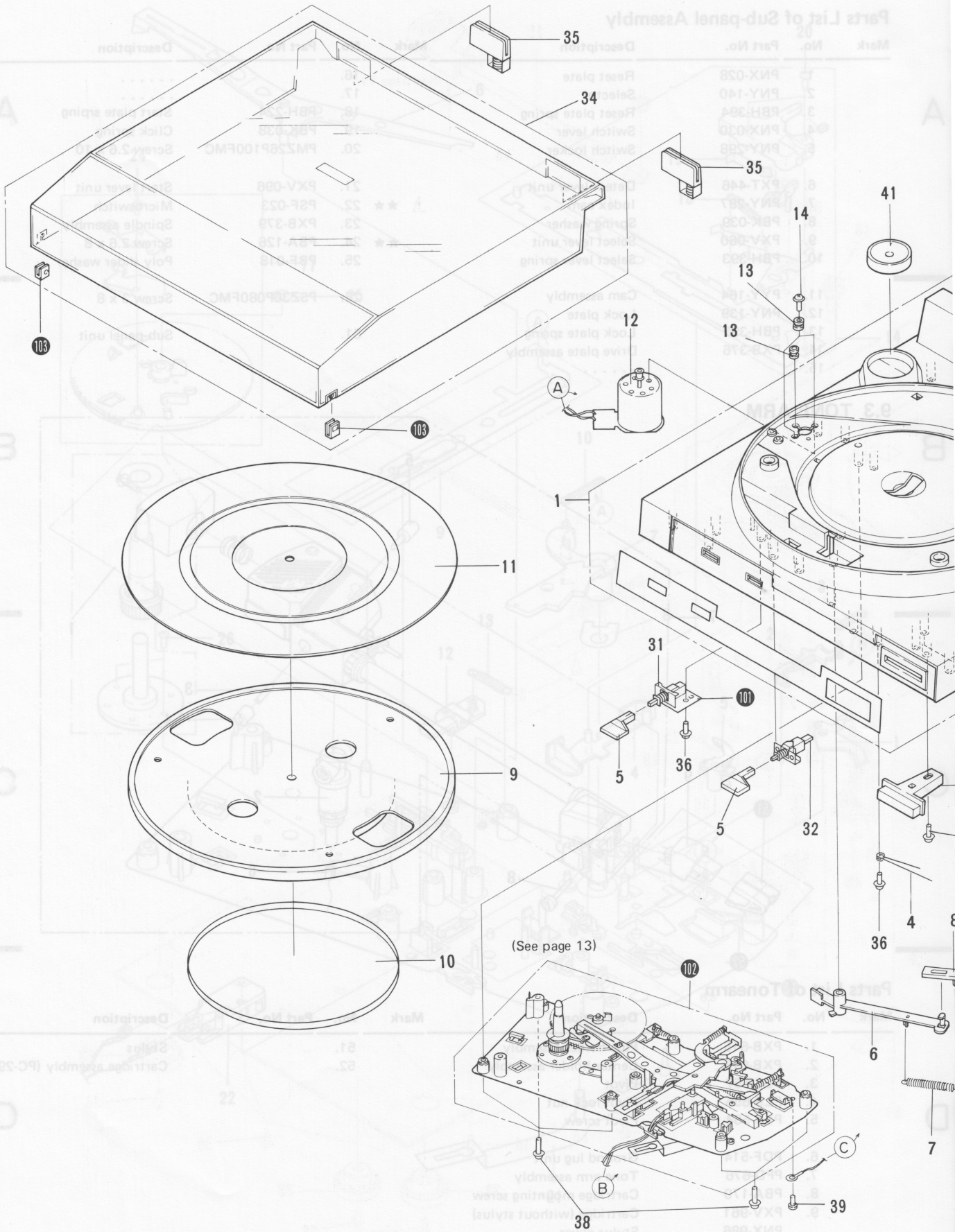
- *Parts without part number cannot be supplied.*
- *The ⚠ mark found on some component parts indicates the importance of the safety factor of the part. Therefore, when replacing, be sure to use parts of identical designation.*
- *For your Parts Stock Control, the fast moving items are indicated with the marks ★★ and ★.*

  ★★ GENERALLY MOVES FASTER THAN ★

  This classification shall be adjusted by each distributor because it depends on model number, temperature, humidity, etc.

Parts List of Exterior

Mark	No.	Part No.	Description
	1.	PXB-425	Panel (F) assembly (PL-X20Z)
		PXB-433	Panel (F) assembly (PL-X21Z)
	2.	PAC-216	S/S button (PL-X20Z)
		PAC-219	S/S button (PL-X21Z)
	3.	PNY-286	S/S lever
	4.	PBH-409	S/S spring
	5.	PAC-217	Button (PL-X20Z)
		PAC-220	Button (PL-X21Z)
	6.	PNY-288	Size lever (A)
	7.	PBH-410	Size spring
	8.	PNY-289	Size lever (B)
	9.	PNR-192	Turntable platter
★★	10.	PEB-224	Belt
	11.	PEA-076	Rubber mat assembly
★★	12.	PYY-163	Motor assembly (with pulley)
	13.	PEB-172	Rubber
	14.	PBA-112	Motor mounting screw
★	15.	PPD-676	Tone arm assembly
	16.	PBA-170	Cartridge mounting screw
	17.	PXV-961	Cartridge assembly (without stylus)
★	18.	PXB-396	Arm rest assembly
	19.	PBK-059	R clip
	20.	PXB-427	EV sheet assembly
	21.	PBH-293	EV spring
	22.	PNY-290	EV cam lever
	23.	PNY-291	Elevation cam
	24.	PBH-411	EV cam spring
	25.	PBK-074	EV plate spring (C)
	26.	PXV-092	EV plate spring (D) unit
	27.	PBF-020	Poly slider washer
	28.	PXB-428	PU plate assembly
	29.	PBH-395	AS spring
	30.	PXB-429	PU cord assembly
★★	31.	PSG-056	Push switch (S2)
★★	32.	PSG-047	Push switch (Record size select)
	33.	PEB-251	Insulator
★★	34.	PNV-058	Dust cover
★	35.	PXB-378	Hinge assembly
	36.	iPC30P100FMC	Screw 3 x 10
	37.	BPZ26P120FZK	Screw 2.6 x 12
	38.	iPC30P290FMC	Screw 3 x 29
	39.	PSZ30P060FMC	Screw 3 x 6
	40.	YE30S-	E washer
	41.	N93-603	45 adaptor
⚠	101.		Switch P.C. board
	102.		Sub-panel assembly
	103.		Rubber
	104.		Bottom plate
	105.		Stylus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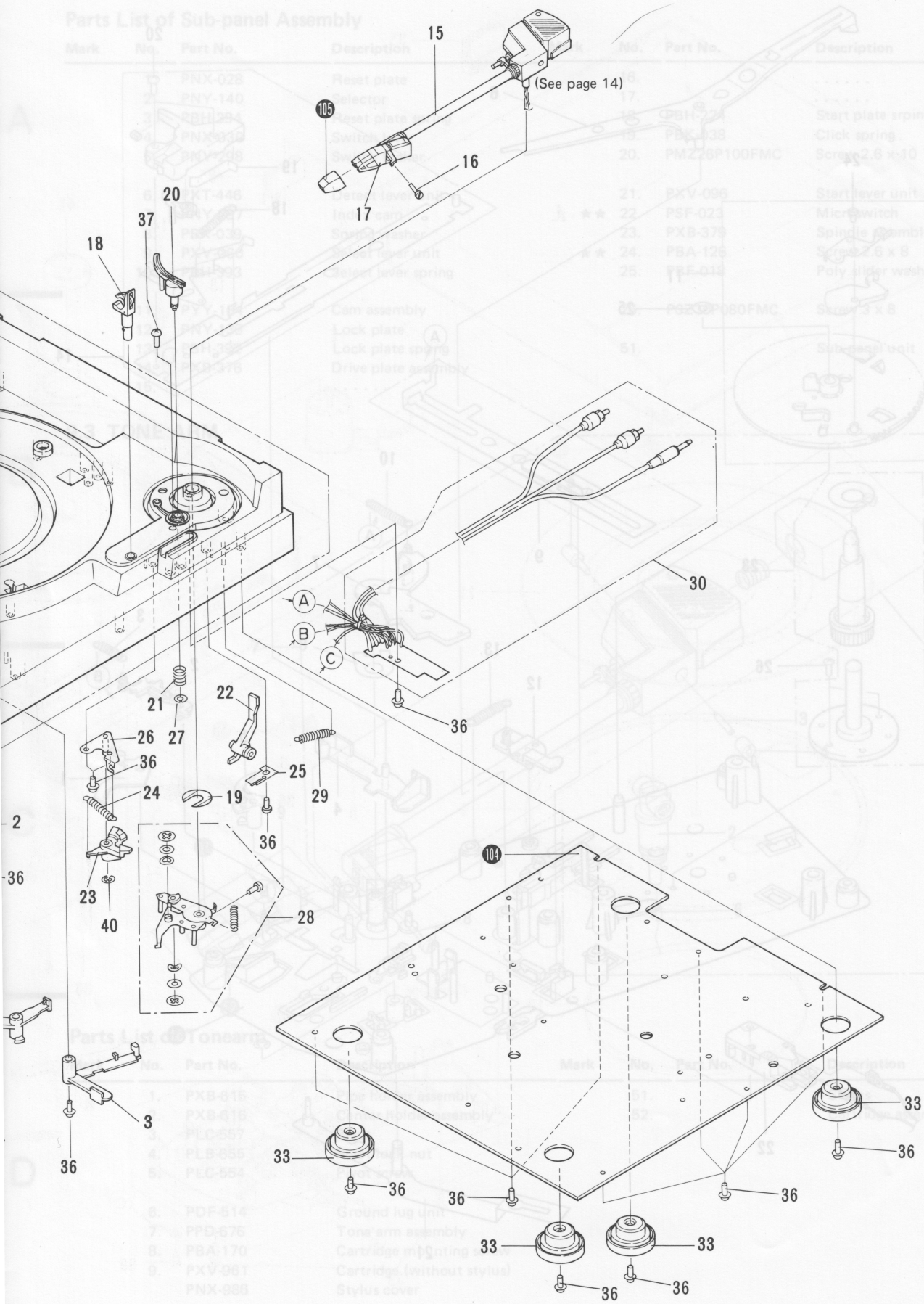
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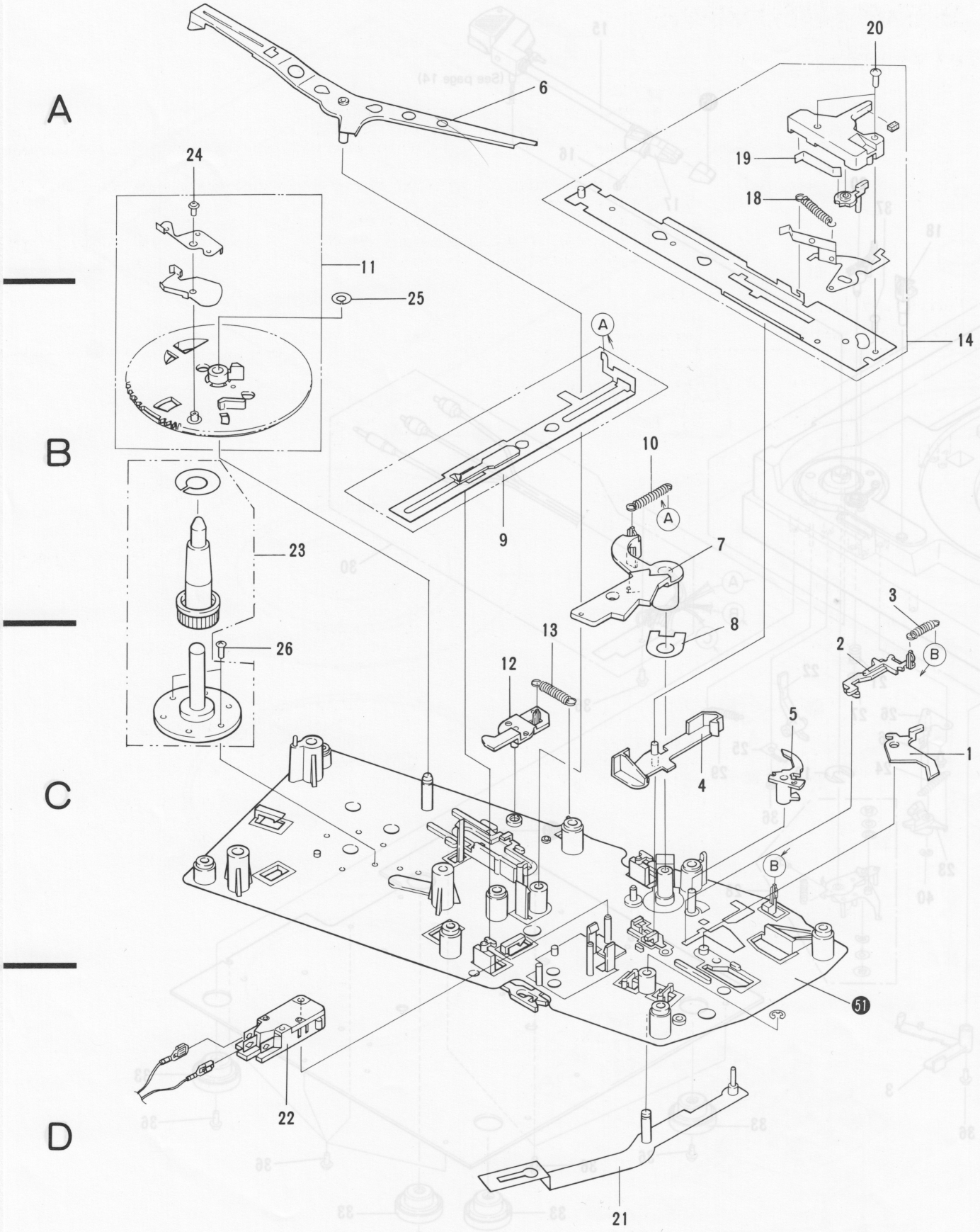
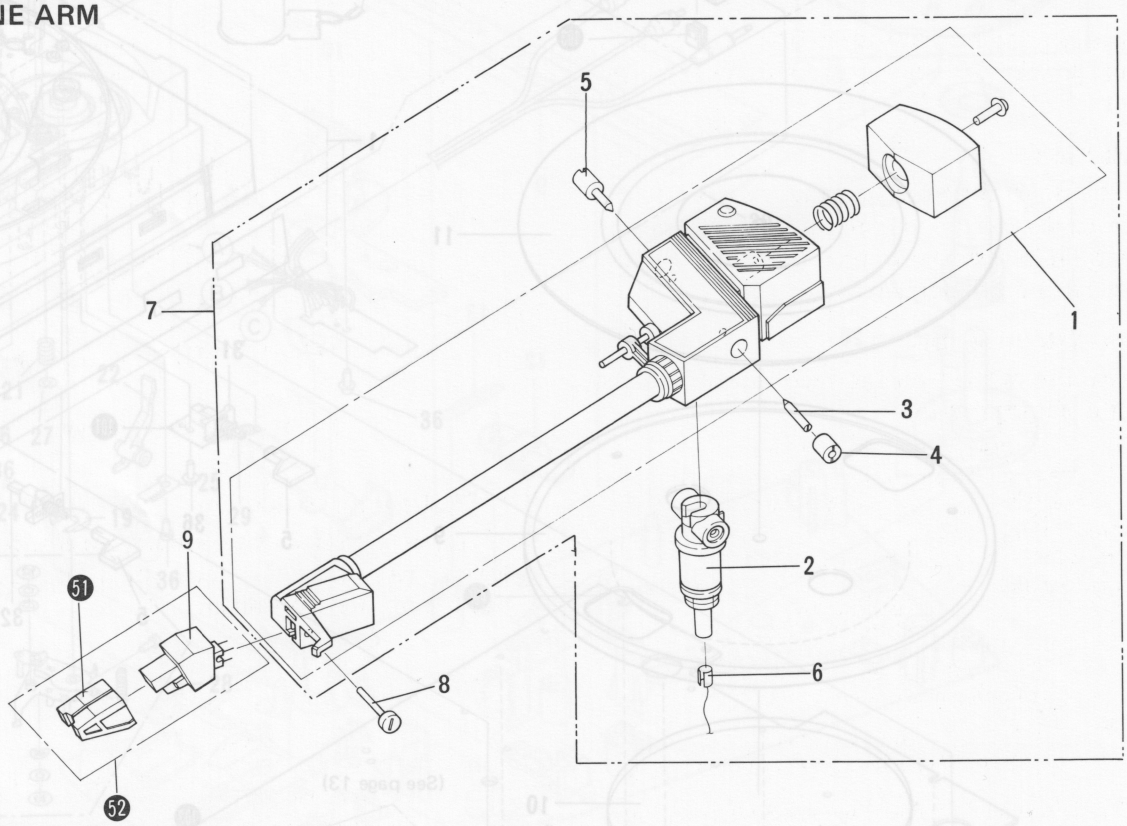
9.2 SUB-PANEL ASSEMBLY



Parts List of Sub-panel Assembly

Mark	No.	Part No.	Description
	1.	PNX-028	Reset plate
	2.	PNY-140	Selector
	3.	PBH-394	Reset plate spring
	4.	PNX-030	Switch lever
	5.	PNY-298	Switch locker
	6.	PXT-446	Detect lever unit
	7.	PNY-297	Index cam
	8.	PBK-039	Spring washer
	9.	PXV-060	Select lever unit
	10.	PBH-393	Select lever spring
	11.	PYY-164	Cam assembly
	12.	PNY-139	Lock plate
	13.	PBH-392	Lock plate spring
	14.	PXB-376	Drive plate assembly
	15.	. . . . .	
	16.	. . . . .	
	17.	. . . . .	
	18.	PBH-224	Start plate srping
	19.	PBK-038	Click spring
	20.	PMZ26P100FMC	Screw 2.6 x 10
	21.	PXV-096	Start lever unit
⚠ ★★	22.	PSF-023	Microswitch
	23.	PXB-379	Spindle assembly
★★	24.	PBA-126	Screw 2.6 x 8
	25.	PBF-018	Poly slider washer
	26.	PSZ30P080FMC	Screw 3 x 8
	51.		Sub-panel unit

9.3 TONE ARM



Parts List of Tonearm

Mark	No.	Part No.	Description
	1.	PXB-615	Pipe holder assembly
	2.	PXB-616	Center holder assembly
	3.	PLC-557	Pivot
	4.	PLB-655	Pivot lock nut
	5.	PLC-554	Pivot screw
	6.	PDF-514	Ground lug unit
	7.	PPD-676	Tone arm assembly
	8.	PBA-170	Cartridge mounting screw
	9.	PXV-961	Cartridge (without stylus)
		PNX-986	Stylus cover
	51.		Stylus
	52.		Cartridge assembly (PC-290T)

10. PRECAUTIONS FOR REASSEMBLY

If new parts have been used, follow these directions and precautions when reassembling a unit after completing repairs. Be sure to lubricate as required, make no mistakes when attaching parts, and avoid all other careless mistakes that may be the cause of trouble later on.

10.1 AREAS THAT REQUIRE LUBRICATION

NOTE:
Types of lubricants and areas where they are used are listed in table 1.

Table 1

Type of Oil	Areas used
Silicon Oil #50000	raising shaft
GYA-008	all other areas

Lubrication points are specified for greases other than GYA-008. Never use a different type of greases.

- **Cam Section**

Apply grease to the heart-shaped grooved section (rear side of the cam) and lock plate sliding section in order to minimize wear on the sliding section and the burden on the mechanism.

- **Driving Plate Assembly**

Decrease the burden on the mechanism and the wear on the sliding section.

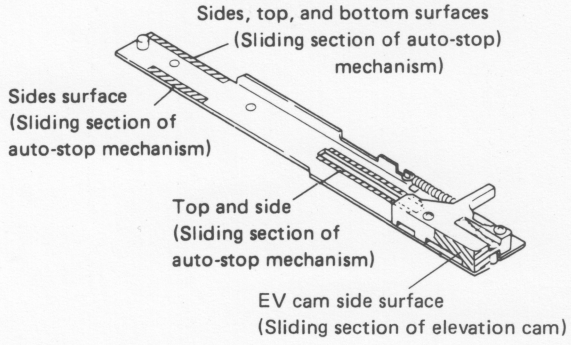


Fig. 10-1 Driving panel assembly section Switch Locker Section

- **Switch Locker Section**

Apply grease to the switch locker (opening) and sub-panel base sliding section to decrease the burden on the mechanism.

When applying grease to the opening (shaft hole), do not apply any grease 2—3mm from the bottom surface. If grease is applied 2—3mm within the bottom surface, it may come out the bottom and go between the switch lever and sub-panel base causing the switch lever to operate ineffectively.

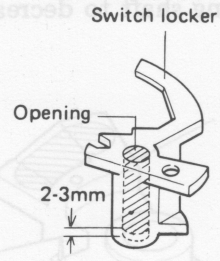


Fig. 10-2 Switch locker section

- **EV Sheet Section**

Apply oil to the raising shaft and sliding section of the bearing to assure stability in the elevation lowering speed.

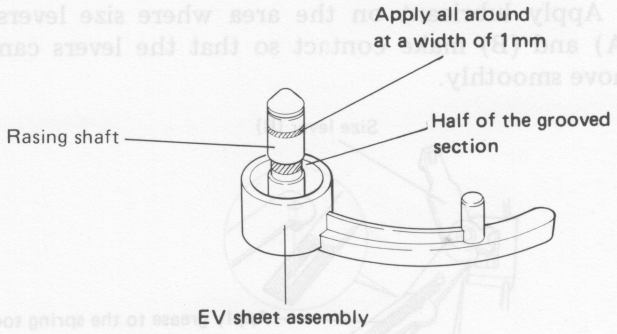


Fig. 10-3 EV sheet section

- **EV Cam Lever Section**

Apply grease to the sliding section of EV plate spring (A) and EV lever unit to decrease the burden on the mechanism.

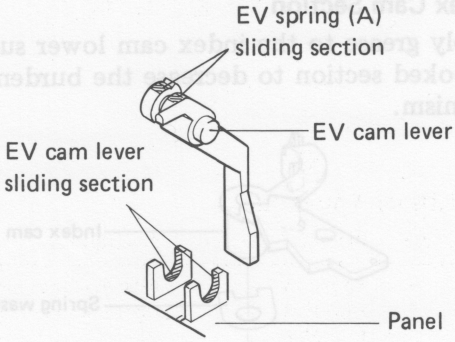


Fig. 10-4 EV cam lever section

- **Elevation Cam Section**

Apply grease to the elevation cam and sliding section of the raising shaft to decrease the burden when operated.

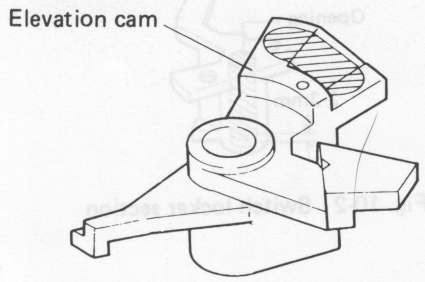


Fig. 10-5 Elevation cam section

- **Size Levers (A) and (B)**

Apply lubricant on the area where size levers (A) and (B) make contact so that the levers can move smoothly.

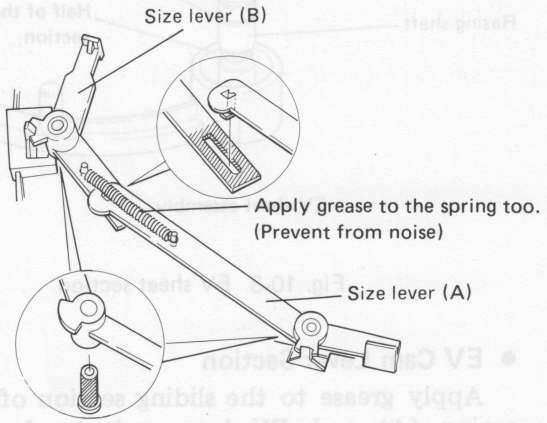


Fig. 10-6 Size lever (A) and (B) section

- **Index Cam Section**

Apply grease to the index cam lower surface of the hooked section to decrease the burden on the mechanism.

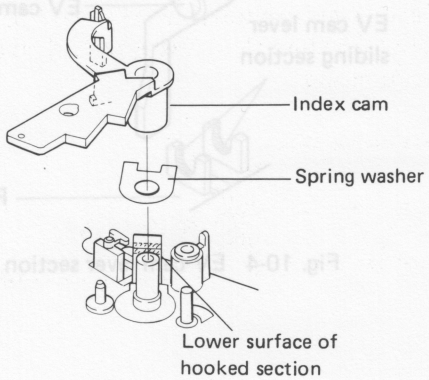


Fig. 10-7 Index cam section

- **Reset Plate Section**

Apply grease to the sub-panel base (shaft) and sliding section of the reset plate to decrease the burden on the mechanism.

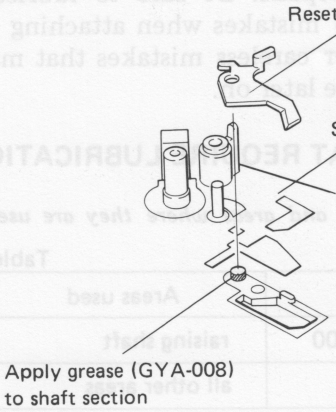


Fig. 10-8 Reset plate section

10.2 PRECAUTIONS FOR ATTACHMENT OF PARTS AND REASSEMBLY

• Cam Assembly Attachment

The cam assembly is attached by letting the lock plate go in the direction Ⓐ as shown in Fig. 10-9.

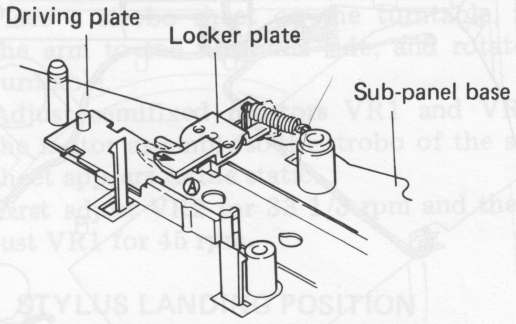


Fig. 10-9 Cam assembly attachment

• PU Plate Assembly Attachment

The PU plate assembly is attached by pushing the PU plate bearing section against the arm rotating shaft fixing nut.

The attachment direction is matched to the center of the support line as shown in Fig. 10-10 (tone arm position on the arm rest).

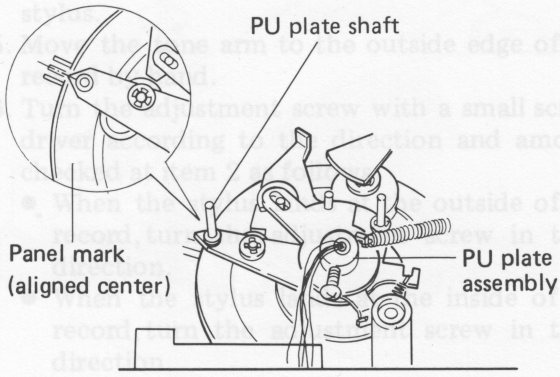


Fig. 10-10 PU plate attachment

• Mechanism Assembly Attachment

1. PU plate shaft position confirmation

When attaching the arm base section to the mechanism section, put the mechanism section switch locker and switch lever in the locked position and verify that the tonearm is in the arm rest location. Also check that the PU plate shaft is in the position shown in Fig. 10-11.

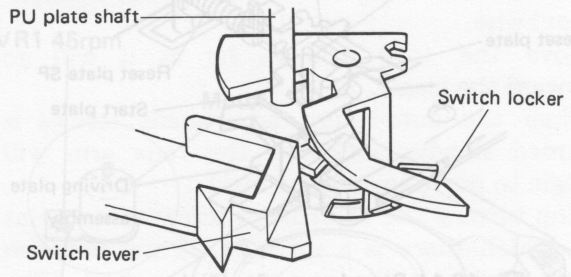


Fig. 10-11 Arm base attachment

2. PU lead wire position confirmation

When attaching the mechanism assembly to the panel, be careful that the PU lead wire is not pinched at the panel boss as shown in Fig. 10-12.

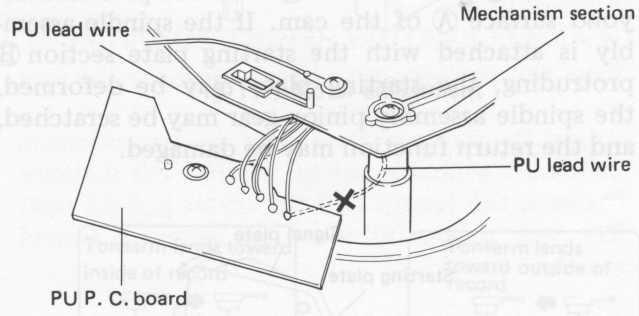


Fig. 10-12 PU lead wire attachment

3. Microswitch lead wire position confirmation

When attaching the mechanism assembly to the panel, be careful that the lead wires do not contact the select lever as shown in Fig. 10-13. If the lead wires contact the select lever, record size detection will malfunction.

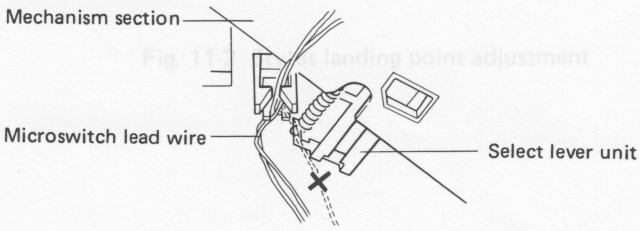


Fig. 10-13 Microswitch lead wire attachment

• Start Lever Unit Attachment

Attach the shaft section of the start lever unit as shown in figure 10-14 so that it comes between the reset plate and start panel.

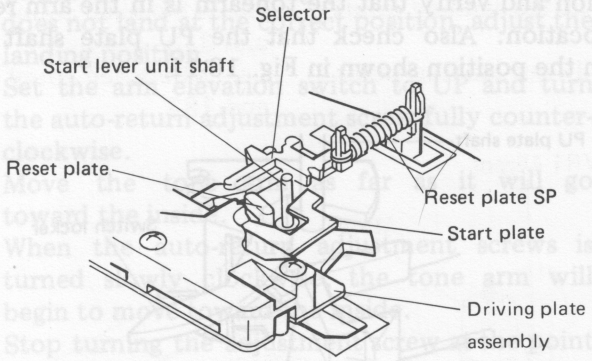


Fig. 10-14 Start lever unit attachment

• Spindle Assembly Attachment

When installing the spindle assembly, set the cam in the mechanism stop location and verify that the starting plate section Ⓑ does not protrude beyond surface Ⓐ of the cam. If the spindle assembly is attached with the starting plate section Ⓑ protruding, the starting plate may be deformed, the spindle assembly pinion gear may be scratched, and the return function may be damaged.

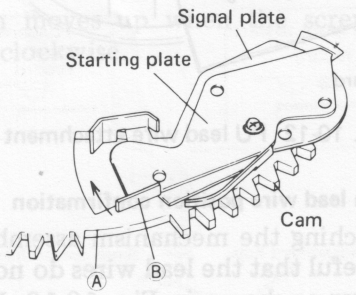


Fig. 10-15 Spindle assembly attachment

• Installing The Cords

When installing the PU lead wire and DC power cord, install them to the panel with string as shown in Fig. 10-16.

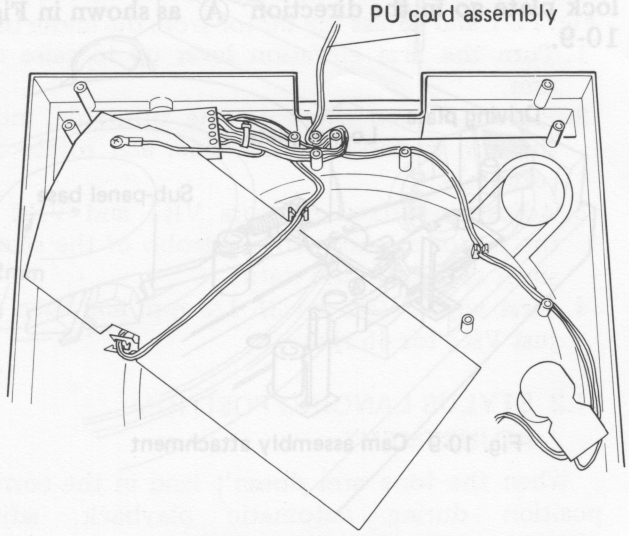


Fig. 10-16 Cords stringing

11. ADJUSTMENTS

11.1 MOTOR ADJUSTMENTS

Place the record player on blocks as shown in Fig. 11-1 and adjust the motor from the under base.

1. Turn the arm elevation lever up to raise the arm.
2. Place a strobo sheet on the turntable, move the arm to the turntable side, and rotate the turntable.
3. Adjust semifixed resistors VR1 and VR2 of the motor assembly so the strobo of the strobo sheet appears to the static.
4. First adjust VR2 for 33 1/3 rpm and then adjust VR1 for 45 rpm.

11.2 STYLUS LANDING POSITION ADJUSTMENT

When the tone arm doesn't land in the correct position during automatic playback, adjust according to the following procedure.

1. Place a 30 cm record on the platter.
2. Press the START/STOP switch and start automatic playback. Note the direction and amount if the landing point is off. (How many mm to the inside or outside from the record grooves.)
3. Depress the START/STOP switch to return the tone arm to its rest.
4. Press the arm elevation switch to raise the stylus.
5. Move the tone arm to the outside edge of the record by hand.
6. Turn the adjustment screw with a small screwdriver according to the direction and amount checked at item 2 as follows:
   - When the stylus lands at the outside of the record, turn the adjustment screw in the ↻ direction.
   - When the stylus lands at the inside of the record, turn the adjustment screw in the ↺ direction.

   One half turn of the adjustment screws moves the tone arm about 12mm.
7. After adjustment, press the PLAY/STOP switch and check if the stylus landing point was correctly adjusted.

   If adjustment is incorrect, repeat items 3 to 6.

Be careful not to damage the record and stylus when making this adjustment.

Adjustment using a test record

(Lowering position adjustment is made with the tone arm on the outside edge of the record.)

30 cm landing point . . . Lands between count 306 and 313.

17 cm landing point . . . Lands between count 175 and 183.

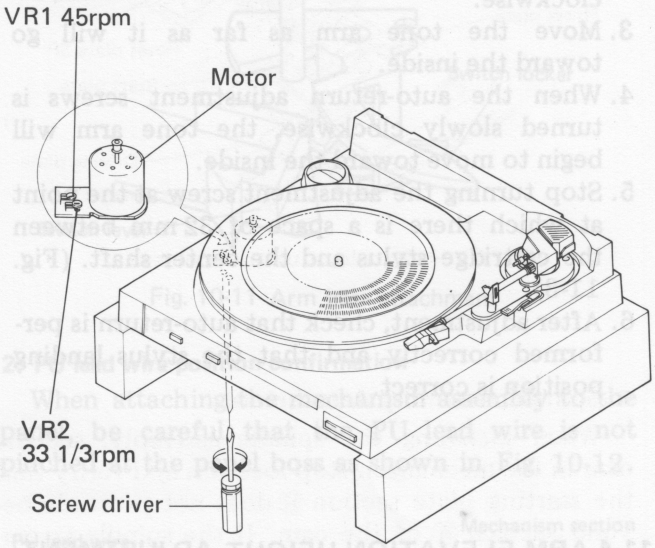


Fig. 11-1 Motor adjustment

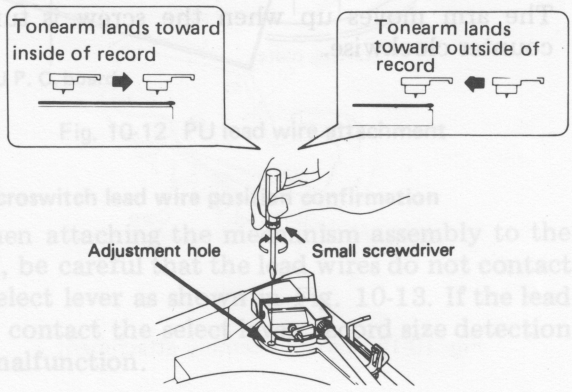


Fig. 11-2 Stylus landing point adjustment

11.3 AUTO-RETURN POSITION ADJUSTMENT

- **Auto-Return Position Adjustment**

When auto-return occurs too early or too late, make the following adjustments.

1. Check the stylus landing position. If the stylus does not land at the correct position, adjust the landing position.
2. Set the arm elevation switch to UP and turn the auto-return adjustment screw fully counter-clockwise.
3. Move the tone arm as far as it will go toward the inside.
4. When the auto-return adjustment screws is turned slowly clockwise, the tone arm will begin to move toward the inside.
5. Stop turning the adjustment screw at the point at which there is a space of 32 mm between the cartridge stylus and the center shaft. (Fig. 11-3)
6. After adjustment, check that auto-return is performed correctly and that the stylus landing position is correct.

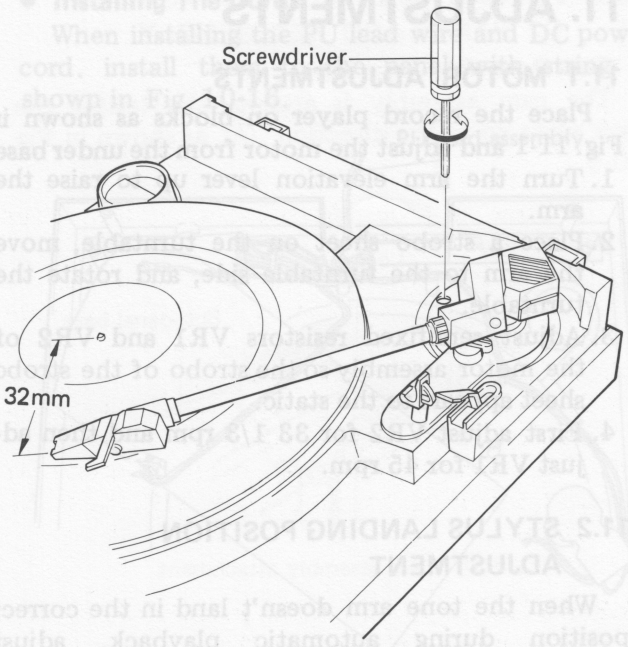


Fig. 11-3 Auto-return position adjustment

11.4 ARM ELEVATION HEIGHT ADJUSTMENT

1. Press the arm elevation switch to move the arm up.
2. Adjust the screw on the side of the arm elevation unit with a philips driver, so that the distance between the record and the stylus is 8 ±2 mm. The arm moves up when the screw is turned counter clockwise.

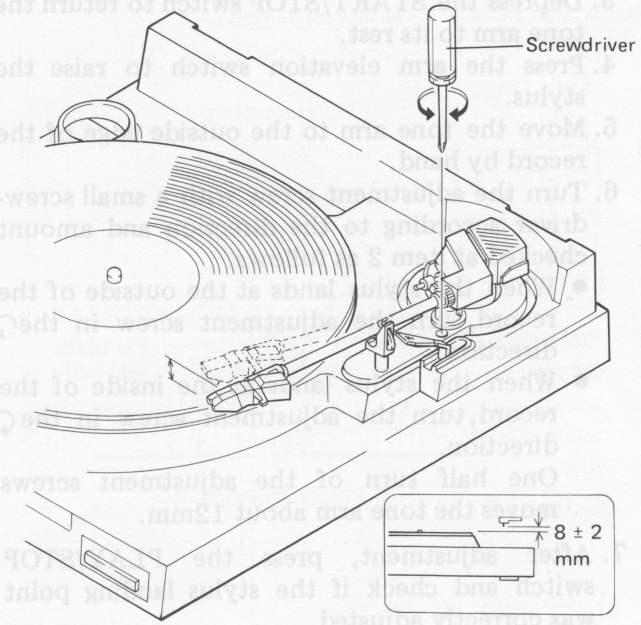


Fig. 11-4 Arm elevation height adjustment

11. RÉGLAGE

11.1 RÉGLAGE DU MOTEUR

Placer le tourne-disques sur des blocs, comme il est montré dans la Fig. 11-1 et régler le moteur depuis le dessous.

1. Tourner le levier de relevage du bras pour soulever le bras de lecture.
2. Placer une feuille stroboscopiques sur le tourne-disques; déplacer le bras jusqu'au côté du tourne-disques et le faire tourner.
3. Régler les résistances demi-fixes VR1 et VR2 de l'ensemble du moteur, jusqu'à ce que la feuille stoboscopique apparaît immobile.
4. D'abord régler VR2 pour avoir la vitesse de 33 1/3 tr/min, ensuite, régler VR1 pour 45 tr/min.

11.2 RÉGLAGE DE LA POSITION DE DESCENTE DE LA POINTE DE LECTURE

Lorsque le bras de lecture ne descend pas sur la position correcte lors de la lecture automatique, réaliser le réglage en suivant la procédure suivante.

1. Placer un disque de 30cm sur le plateau.
2. Appuyer sur la touche de marche/arrêt (START/STOP) et faire débuter la lecture automatique. Noter la direction et la grandeur de l'écart du point de descente. (Nombre de mm vers l'intérieur ou vers l'extérieur du sillon.)
3. Appuyer sur la touche START/STOP pour faire retourner le bras de lecture sur son support.
4. Appuyer sur la touche de relevage du bras pour soulever la pointe de lecture.
5. Déplacer à la main le bras de lecture vers la périphérie du disque.
6. Tourner la vis de réglage à l'aide d'un petit tournevis, en fonction de la direction et de la quantité mesurées lors du point 2, comme suit:
   - Lorsque la pointe de lecture descend vers l'extérieur du disque, tourner la vis de réglage dans le sens
   - Lorsque la pointe de lecture descend vers l'intérieur du disque, tourner la vis de réglage dans le sens

   Un demi-tour de la vis de réglage correspond à un déplacement d'environ 12mm du bras de lecture.
7. Après le réglage, appuyer sur la touche START/STOP et vérifier si le réglage de la position de descente a été correctement effectué.
   Si le réglage n'est pas correct, répéter les étapes 3 à 6.

Prendre soin de ne pas endommager le disque ni la pointe de lecture en réalisant ce réglage.

Réglage au moyen d'un disque d'essai

(Le réglage de la position d'abaissement est réalisé avec le bras de lecture placé sur la périphérie du disque.

Point de descente
pour 30cm . . . . . Descente entre les valeurs 306 et 313.

Point de descente
pour 17cm . . . . . Descente entre les valeurs 175 et 183.

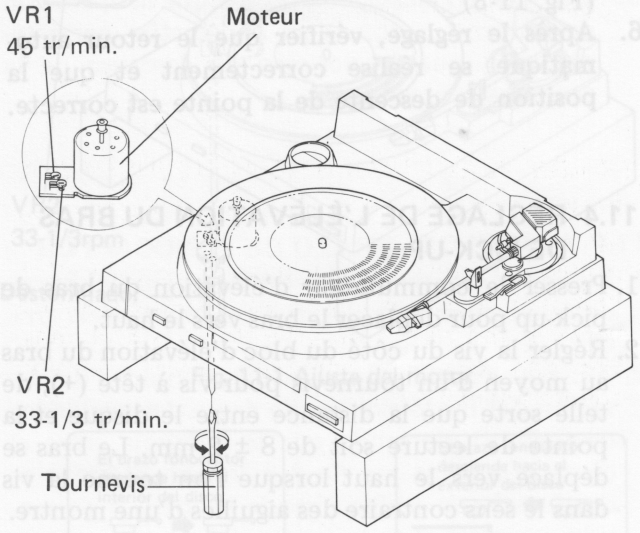


Fig. 11-1 Réglage du moteur

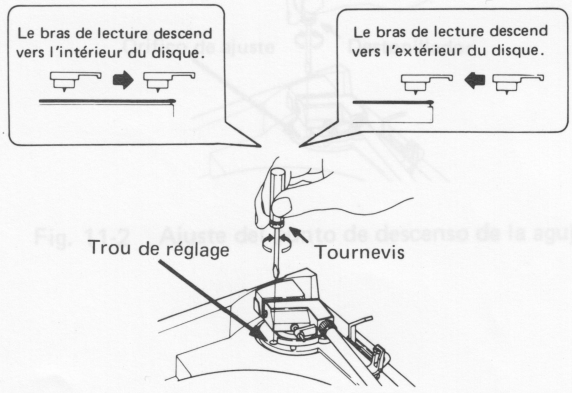

Le bras de lecture descend vers l'intérieur du disque.
Le bras de lecture descend vers l'extérieur du disque.
Trou de réglage
Tournevis

Fig. 11-4 Réglage du point de descente de la pointe de lecture

11.3 RÉGLAGE DE RETOUR AUTOMATIQUE

- **Réglage de la position de retour automatique**

Réaliser les réglages suivants lorsque le retour automatique se produit tôt ou trop tard.

1. Contrôler la position de descente de la pointe de lecture. Si la pointe de lecture ne descend pas sur la position correcte, ajuster la position de descente.
2. Régler la touche de relevage du bras sur la position "UP" et tourner la vis de réglage du retour automatique à fond dans le sens contraire des aiguilles d'une montre.
3. Déplacer le bras de lecture le plus possible vers l'intérieur.
4. Lorsque la vis de réglage du retour automatique est tournée lentement dans le sens des aiguilles d'une montre, le bras de lecture commence à se déplacer vers l'intérieur.
5. Arrêter de tourner la vis de réglage sur le point pour lequel il y a un écart de 32mm entre la pointe de lecture et l'axe central. (Fig. 11-3)
6. Après le réglage, vérifier que le retour automatique se réalise correctement et que la position de descente de la pointe est correcte.

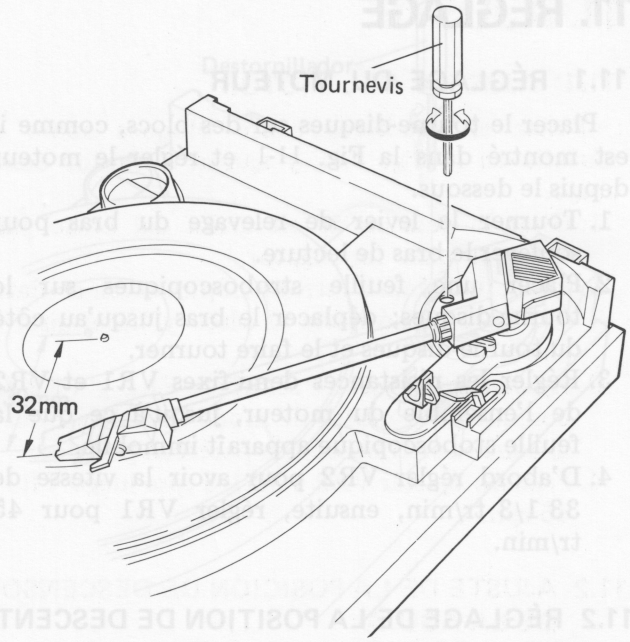


Fig. 11-3 Réglage de retour automatique

11.4 RÉGLAGE DE L'ÉLÉVATION DU BRAS DE PICK-UP

1. Presser le commutateur d'élévation du bras de pick-up pour déplacer le bras vers le haut.
2. Régler la vis du côté du bloc d'élévation du bras au moyen d'un tournevis pour vis à tête (+), de telle sorte que la distance entre le disque et la pointe de lecture soit de 8 ± 2 mm. Le bras se déplace vers le haut lorsque l'on tourne la vis dans le sens contraire des aiguilles d'une montre.

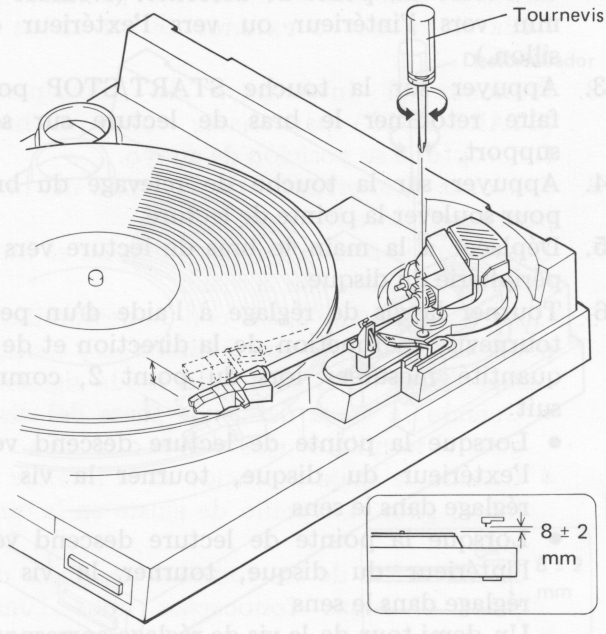


Fig. 11-4 Réglage de l'élévation du bras de pick-up

11. AJUSTE

11.1 AJUSTES DEL MOTOR

Poner el giradiscos sobre bloques como se muestra en la Fig. 11-1 y ajustar el motor desde abajo.

1. Girar la palanca de elevación del brazo para elevar el brazo fonocaptor.
2. Poner una lámina estroboscópica sobre el plato, mover el brazo hacia el plato y hacer girar el plato.
3. Ajustar los resistores semifijos VR1 y VR2 del conjunto del motor de mode que el estrobo y la lámina estroboscópica parezcan parados.
4. Primero ajustar VR2 a 33 1/3 rpm luego VR1 a 45 rpm.

11.2 AJUSTE DE LA POSICIÓN DE DESCENSO DE LA AGUJA

Cuando el brazo fonocaptor no desciende en la posición correcta durante la reproducción automática, ajustar de acuerdo con el procedimiento siguiente.

1. Poner un disco de 30cm sobre el plato.
2. Presionar el interruptor de inicio/parada (START/STOP) e iniciar la reproducción automática. Notar la dirección y cantidad si el punto de descenso es incorrecto. (Cuántos mm hacia el interior o exterior de los surcos del disco.)
3. Presionar el interruptor de inicio/parada (START/STOP) para hacer volver el brazo fonocaptor a su posición de apoyo.
4. Presionar el interruptor de elecación del brazo para hacer ascender la aguja.
5. Desplazar el brazo fonocaptor hacia el borde exterior del disco con la mano.
6. Girar el tornillo de ajuste con un destornillador pequeño de acuerdo con la dirección y cantidad comprobadas en el item 2 del modo siguiente:
   - Cuando la aguja desciende fuera del disco, girar el tornillo de ajuste en la dirección .
   - Cuando la aguja desciende en el interior del disco, girar el tornillo de ajuste en la dirección
     Media vuelta de los tornillos de ajuste desplaza el brazo fonocaptor unos 10mm.
7. Después del ajuste, presionar el interruptor de reproducción/parada (PLAY/STOP) y comprobar si el punto de descenso de la aguja se ha ajustado correctamente.
   Si el ajuste es incorrecto, repetir los items 3 al 6.

Tener cuidado de no dañar el disco ni la aguja al efectuar este ajuste.

Ajuste empleando un disco de prueba

(El ajuste de la posición de descenso se efectúa con el brazo fonocaptor sobre su borde exterior del disco.)

Punto de descenso para 30cm ..... Desciende entre el cómputo 306 y 313.

Punto de descenso para 17cm ..... Desciende entre el cómputo 175 y 183.

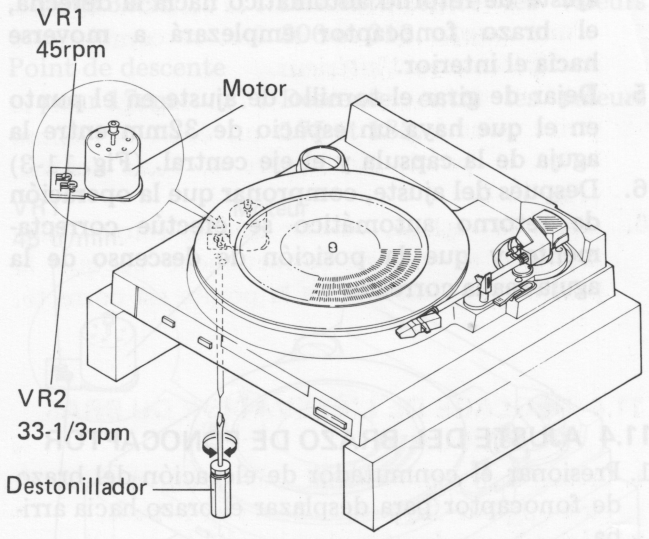


Fig. 11-1 Ajuste del motor

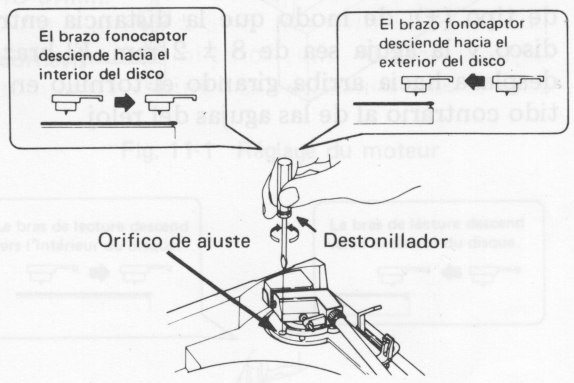

El brazo fonocaptor desciende hacia el interior del disco
El brazo fonocaptor desciende hacia el exterior del disco
Orifico de ajuste
Destonillador

Fig. 11-2 Ajuste del punto de descenso de la aguja

11.3 AJUSTE DE RETORNO AUTOMÁTICO

- **Ajuste de la posición de retorno automático**

Cuando el retorno automático se produce demasiado rápido o demasiado tarde, efectuar los ajustes siguientes.

1. Comprobar la posición de descenso de la aguja. Si la aguja no desciende en la posición correcta, ajustar la posición de descenso.
2. Ajustar el interruptor de elevación del brazo en la posición UP y girar el tornillo de ajuste de retorno automático completamente hacia la izquierda.
3. Desplazar el brazo fonocaptor hacia el interior al máximo.
4. Cuando se giran lentamente los tornillos de ajuste de retorno automático hacia la derecha, el brazo fonocaptor emplezará a moverse hacia el interior.
5. Dejar de girar el tornillo de ajuste en el punto en el que haya un espacio de 32mm entre la aguja de la cápsula y el eje central. (Fig. 11-3)
6. Después del ajuste, compronar que la operación de retorno automático se efectúe correctamente y que la posición de descenso de la aguja sea la correcta.

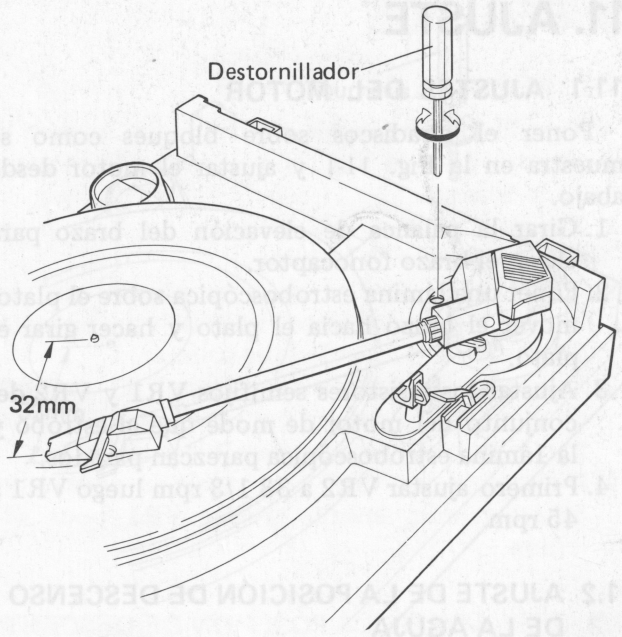


Fig. 11-3 Ajuste de retorno automático

11.4 AJUSTE DEL BRAZO DE FONOCAPTOR

1. Presionar el conmutador de elevación del brazo de fonocaptor para desplazar el brazo hacia arriba.
2. Ajustar el tornillo en el lado de la unidad de elevación del brazo por medio de un destornillador de tipo (+), de modo que la distancia entre el disco y la aguja sea de 8 ± 2 mm. El brazo se desplaza hacia arriba girando el tornillo en sentido contrario al de las agujas del reloj.

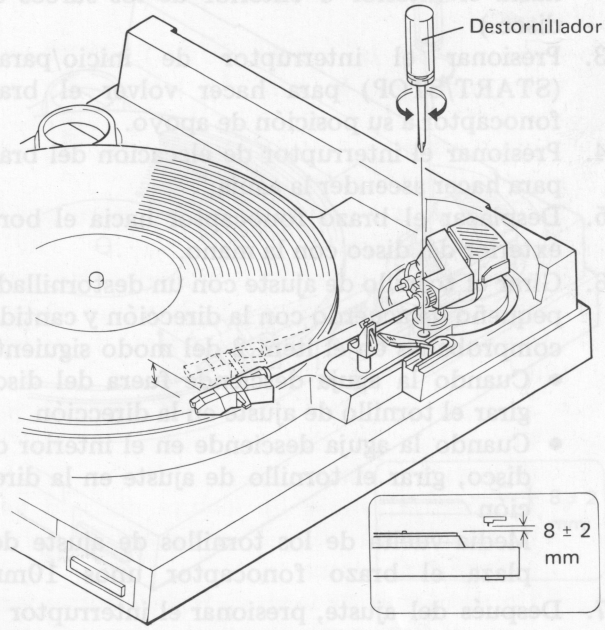


Fig. 11-4 Ajuste del brazo de fonocaptor

QUESTIONNAIRE

MODEL _____

One Model per questionnaire

Dear Servicer,

Thank you for your cooperation in the post-sale service of Pioneer products.

This questionnaire is used as a tool to improve the serviceability of our products and service manuals. Please evaluate this model and service manual by answering the following questions. Your ideas may be realized in our future products. Your answers will be appreciated. Thank you.

PIONEER ELECTRONIC CORP.

T. Nakagawa, Manager, Service Section, International Division

1. SERVICING EVALUATION	Circle applicable number:	Good		Fair		Poor
a. Disassembly/Re-assembly:		1	2	3	*4	*5
b. Circuit Checks:		1	2	3	*4	*5
c. Replacement of Parts:		1	2	3	*4	*5
d. Adjustment (s):		1	2	3	*4	*5

* If (4) or (5) was circled, please be specific.

e. Your advice, opinion or ideas related to servicing this product.

2. SERVICE MANUAL EVALUATION

a. Circuit & Mechanism Description

b. Circuit Diagram

3. OTHER

Please describe other areas of servicing which you may find difficult.

Completed by : Date :

Company Name :

Address :

City/State/Zip :

Please send this form filled to the distributor in your country.